

Abstract

This thesis examines the application of neural networks in the context of option pricing. Throughout the thesis, different architecture choices and prediction parameters are tested and compared in order to achieve better performance and higher accuracy in option valuation. Two different volatility forecast mechanisms are used to compare neural networks performance with Black Scholes parametric model. Moreover, the performance of a neural network is compared also to more advanced modular neural networks. A new technique of adding rational prediction assumptions to neural network prediction is tested and the thesis shows the importance of adding virtual options fulfilling these assumptions in order to achieve better training of the neural network. This method comes out to increase the prediction power of the network significantly. The thesis also shows the neural network prediction outperforms the traditional parametric methods. The size and number of hidden layers in a neural network is tested with an emphasis to provide a benchmark and a structured way how to choose neural network parameters for future applications in option pricing.

JEL Classification	C13, C14, G13
Keywords	Option pricing, Neural networks, Modular neural networks, S&P500 index options
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